1. Requirement for Restriction Under 35 U.S.C. §121.

A Requirement for Restriction Under 35 U.S.C. §121 has been made between inventions of the following groups:

I. Claims 1-4, drawn to a composition of matter differentiable by selective radiation illumination consisting essentially of a monomer and a dye, classified in class 430, subclass 281.1.

II. Claims 5-9, drawn to an initially homogeneous medium that is differentiated by selective exposure to radiation consisting essentially of a photopolymer, binder and a photoexcitable dye which when photoexcited will bind to the photopolymer, classified in class 430, subclass 286.1.

III. Claims 10-24, drawn to a medium suitably selectively recorded by radiation consisting essentially of a host matrix, a liquid monomer, a photoexitable dye that will upon photoexcitation bind to the polymer to be formed from the liquid monomer, classified in class 430, subclass 285.1

IV. Claims 25-27, drawn to a method of radiatively recording information in a photosensitive medium, classified in class 430, subclass 269.

V. Claims 28-33, drawn to a writable radiation memory system comprising a first laser, a mask, a 4-f lens system, a volume optical recording medium consisting essentially of a host matrix containing a polymerized photopolymer doped with a dye that photoinitiates photopolymerization wherein said matrix is capable of further photopolymerization by the dye upon selective exposure of regions of the matrix, classified in class 430, subclass 270.1.

Applicants affirm their election of the invention of Group III, claims 10-24. Applicants election is (now) **without** traverse. Claims 1-9 and 25-33, withdrawn from consideration, are canceled. There is **no** change in inventorship.

2. Objection to / Amendment to the Specification

Reference to the related patent application is updated at specification page 1.

3. Rejections Under 35 U.S.C. §112, Second Paragraph

Claims 10-24 were rejected under 35 U.S.C. §112, second paragraph for reasons going primarily to indeterminacy as to what is the status/state of the claimed physical elements -- which elements undergo functional changes -- within each claim.

The claims are amended to make clear exactly what is the claimed state/condition of each claimed element. "Characterized in that" language is added to claims 21 and 23, in particular, to make clear exactly what will be the characteristic(s) of the **written** medium therein claimed from the **un**written medium.

4. Prior Art

Applicant has considered the prior art made of reference and finds that it neither teaches nor suggests, in any combination, Applicant's claimed medium where a dye -- initially homogeneously distributed within the medium -- (i) physically moves within the medium and, after moving, (ii) substantially immobilizes, all under the influence, and as an effect of, selective radiation illumination of the medium.

5. Summary

The present amendment and remarks have overcome and discussed each of the bases for the rejections presented in the Office Action. No new subject matter has been introduced by the present amendment.

In consideration of the preceding amendment and accompanying remarks, the present application is deemed in condition for allowance. The timely action of the Examiner to that end is

earnestly solicited.

Applicant's undersigned attorney is at the Examiner's disposal should the Examiner wish to discuss any matter which might expedite prosecution of this case.

Sincerely yours,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on the date written below.

November 1, 2001
Date

William C. Fuess
Typed Name of Person Mailing Correspondence

William C. Fuess
Signature of Person Mailing Correspondence

CLAIMS
(IN AMENDED FORM)

10. (Amended) A medium extending over an area that is in its area suitably selectively [recorded] written by radiation at a writing time, the medium consisting essentially of

a host matrix; containing

a liquid monomer, in which monomer molecular mobilities are relatively higher, that [is] can be photopolymerized into a solid polymer, in which polymer molecular mobilities are relatively lower, the monomer [initially] being at a time before photopolymerization substantially homogeneously doped with

a dye that [is] can be photoexcit[able]ed to bind to at least the polymer;

wherein upon selective exposure of certain areas of the matrix by radiation at the writing time, both (i) polymerization of the monomer into the polymer and (ii) [dye] fixing of the dye to the polymer will occur in these selected areas, that is, the monomer undergo[ing]es a polymerization process that solidifies the matrix, while, simultaneously, molecules of radiation-exposed and photoexcited dye [molecules] bind to at least molecules of polymer [molecules];

wherein dye molecules that are photoexcited in the selected regions at the writing time so as to bind to at least the polymer molecules become, due to the relatively lower molecular mobility in the polymer, relatively fixed in their bound locations while other un-photoexcited dye molecules not in the selected regions remain relatively more mobile, resulting in a[n initial] migration and a redistribution of dye at the writing time from unexposed to photoexposed regions until, dye migration being substantially complete, photopolymerization occurs, locking the migrated and redistributed dye in place at a relatively higher concentration at the selectively photoexposed regions;

wherein there [is] comes to exist after the writing time a concentration gradient of dye molecules in the [material] matrix from the unexposed to the exposed areas of the matrix, this

concentration gradient resulting from diffusion of the dye from the unexposed to the exposed areas;

wherein by radiation writing dye concentration is increased in the exposed areas relative to the unexposed areas;

wherein after [selective] radiation exposure in selected ares of the matrix stops an excess concentration of dye molecules in these selectively exposed areas serves as a record of the selective radiation exposure.

11. (Amended) The medium according to claim 10

wherein the dye is photoexcitable by the radiation at the writing time to bind to the monomer as well as to the polymer;

wherein [initial] migration and redistribution of the dye at the writing time still transpires[, with]; and

wherein, nonetheless to the fact that the dye migrating and redistributing at the writing time also binds the monomer, the dye and the monomer will still photopolymeriz[ing]e to dye and to polymer more selectively pronouncedly in photoexcited, and exposed, areas as opposed to unexposed areas.

12. (Amended) The medium according to claim 10 further including

an inhibitor of the photopolymerization so that in regions of the matrix encountering low radiation exposure all polymerization is inhibited nonetheless that in other regions of the matrix where radiation is concentrated become fully polymerized.

13. (Restated) The medium according to claim 12 wherein the inhibitor of the photopolymerization consists essentially of

oxygen.

14. (Restated) The medium according to claim 10 wherein the host matrix consists essentially of

binder; and

solvent;

wherein the dye has a greater affinity for the photopolymer than for the binder and the solvent.

15. (Restated) The medium according to claim 14 wherein the binder consists essentially of

cellulose acetate propionate;

and wherein the solvent consists essentially of

acetone.

16. (Restated) The medium according to claim 10 wherein the photopolymer consists essentially of

a monomer;

a crosslinker;

an initiator; and

a photosensitizer.

17. (Restated) The medium according to claim 16 wherein the monomer consists essentially of

dipentaerythritol pentaacrylate;

wherein the crosslinker consists essentially of

1-vinyl-2-pyrrolidinone;

wherein the initiator consists essentially of

N-phenyl glycine; and

wherein the photosensitizer consists essentially of

camphor quione.

18. (Restated) The medium according to claim 16 wherein the dye is drawn from the group consisting essentially of

Rhodamine B; and

Bodipy Red.

19. (Restated) The medium according to claim 10

wherein the photopolymer is initially substantially uniformly doped with dye.

20. (Restated) The medium according to claim 10

wherein the dye is fluorescent.

21. (Amended) The medium according to claim 20 <u>that has been</u>

selectively illuminated in regions at the write time so as to write [and to store] data into the medium serving as an optical memory, the written medium characterized in that

a higher concentration of dye exists in radiatively written than in unwritten regions;

wherein reading of the written medium serving as an optical memory can transpir[ing]e by introducing fluorescence of the dye.

22. (Amended) The medium according to claim 21 wherein the selectively illuminated regions are in the volumetric spatial form of voxels, the written optical memory thus being a three-dimensional volume optical memory.

23. (Amended) The medium according to claim 10 that has been selectively illuminated in regions at the write time to write [and to store] data into the medium serving as an optical memory, the written medium characterized in that

dye has migrated so as to substantially exist only in radiatively written regions, and to no longer exist in unwritten regions;

wherein reading of the optical memory can transpir[ing]e by detecting relative presence or absence of the dye.

24. (Amended) The medium according to claim 23 wherein the selectively illuminated regions are in the volumetric spatial form of voxels, the written optical memory thus being a three-dimensional optical memory.

CLAIMS
(IN PLAIN TEXT FORM)

10. A medium extending over an area that is in its area suitably selectively written by radiation at a writing time, the medium consisting essentially of

a host matrix; containing

a liquid monomer, in which monomer molecular mobilities are relatively higher, that can be photopolymerized into a solid polymer, in which polymer molecular mobilities are relatively lower, the monomer being at a time before photopolymerization substantially homogeneously doped with

a dye that Can be photoexcited to bind to at least the polymer;

wherein upon selective exposure of certain areas of the matrix by radiation at the writing time, both (i) polymerization of the monomer into the polymer and (ii) fixing of the dye to the polymer will occur in these selected areas, that is, the monomer undergoes a polymerization process that solidifies the matrix, while, simultaneously, molecules of radiation-exposed and photoexcited dye bind to at least molecules of polymer;

wherein dye molecules that are photoexcited in the selected regions at the writing time so as to bind to at least the polymer molecules become, due to the relatively lower molecular mobility in the polymer, relatively fixed in their bound locations while other un-photoexcited dye molecules not in the selected regions remain relatively more mobile, resulting in a migration and a redistribution of dye at the writing time from unexposed to photoexposed regions until, dye migration being substantially complete, photopolymerization occurs, locking the migrated and redistributed dye in place at a relatively higher concentration at the selectively photoexposed regions;

wherein there comes to exist after the writing time a concentration gradient of dye molecules in the matrix from the unexposed to the exposed areas of the matrix, this concentration gradient resulting from diffusion of the dye from the unexposed to

the exposed areas;

wherein by radiation writing dye concentration is increased in the exposed areas relative to the unexposed areas;

wherein after radiation exposure in selected ares of the matrix stops an excess concentration of dye molecules in these selectively exposed areas serves as a record of the selective radiation exposure.

11. The medium according to claim 10

wherein the dye is photoexcitable by the radiation at the writing time to bind to the monomer as well as to the polymer;

wherein migration and redistribution of the dye at the writing time still transpires; and

wherein, nonetheless to the fact that the dye migrating and redistributing at the writing time also binds the monomer, the dye and the monomer will still photopolymerize to dye and to polymer more selectively pronouncedly in photoexcited, and exposed, areas as opposed to unexposed areas.

12. The medium according to claim 10 further including

an inhibitor of the photopolymerization so that in regions of the matrix encountering low radiation exposure all polymerization is inhibited nonetheless that in other regions of the matrix where radiation is concentrated become fully polymerized.

13. The medium according to claim 12 wherein the inhibitor of the photopolymerization consists essentially of

oxygen.

14. The medium according to claim 10 wherein the host matrix consists essentially of

binder; and

solvent;

wherein the dye has a greater affinity for the photopolymer than for the binder and the solvent.

15. The medium according to claim 14 wherein the binder consists essentially of

cellulose acetate propionate;

and wherein the solvent consists essentially of

acetone.

16. The medium according to claim 10 wherein the photopolymer consists essentially of

a monomer;

a crosslinker;

an initiator; and

a photosensitizer.

17. The medium according to claim 16 wherein the monomer consists essentially of

dipentaerythritol pentaacrylate;

wherein the crosslinker consists essentially of

1-vinyl-2-pyrrolidinone;

wherein the initiator consists essentially of

N-phenyl glycine; and

wherein the photosensitizer consists essentially of

camphor quione.

18. The medium according to claim 16 wherein the dye is drawn from the group consisting essentially of

Rhodamine B; and

Bodipy Red.

19. The medium according to claim 10

wherein the photopolymer is initially substantially uniformly doped with dye.

20. The medium according to claim 10

wherein the dye is fluorescent.

21. The medium according to claim 20 that has been selectively

illuminated in regions at the write time so as to write data into the medium serving as an optical memory, the written medium characterized in that

a higher concentration of dye exists in radiatively written than in unwritten regions;

wherein reading of the written medium serving as an optical memory can transpire by introducing fluorescence of the dye.

22. The medium according to claim 21 wherein the selectively illuminated regions are in the volumetric spatial form of voxels, the written optical memory thus being a three-dimensional volume optical memory.

23. The medium according to claim 10 that has been selectively illuminated in regions at the write time to write data into the medium serving as an optical memory, the written medium characterized in that

dye has migrated so as to substantially exist only in radiatively written regions, and to no longer exist in unwritten regions;

wherein reading of the optical memory can transpire by detecting relative presence or absence of the dye.

24. The medium according to claim 23 wherein the selectively illuminated regions are in the volumetric spatial form of voxels, the written optical memory thus being a three-dimensional optical memory.